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Nyctereutes procyonoides.

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Nyctereutes Temminck, 1838

Nyctereutes Temminck, 1838:285. Type species *Canis viverrinus* Temminck.

CONTEXT AND CONTENT. Order Carnivora, Superfamily Canoidea, Family Canidae, Subfamily Caninae. The genus *Nyctereutes* includes one living species.

Nyctereutes procyonoides (Gray, 1834)

Raccoon Dog

Canis procyonoides Gray, 1834:v.2, pl. 1. Type locality unknown, restricted to "vicinity of Canton, China" by Allen (1938:346).

Canis viverrinus Temminck, 1838:285. Type locality "Japan." [more detailed description by Wagner (1841) and Temminck (1842)].

Nyctereutes albus Hornaday, 1904:71. Type locality "Nagasaki, Japan."

Nyctereutes sinensis Brass, 1904:22. Type locality "Yangtze Valley, China."

Nyctereutes ussuriensis Matschie, 1908:178. Type locality "der Nahe der Ussurimundung" [mouth of Ussuri River, eastern Siberia, USSR].

Nyctereutes amurensis Matschie, 1908:179. Type locality "Amur."

Nyctereutes stegmanni Matschie, 1908:180. Type locality "Hing-an-fu," China.

Nyctereutes koreensis Mori, 1922:607. Type locality "Giseifu, near Seoul, Korea."

CONTEXT AND CONTENT. Context given in generic summary. Five subspecies of *N. procyonoides* are recognized (Ellerman and Morrison-Scott, 1966):

N. p. koreensis Mori, 1922:607, see above.

N. p. orestes Thomas, 1923:657. Type locality "NW Flank [of Likiang Range]. 10,000–12,000'," Yunnan, China.

N. p. procyonoides (Gray, 1834:v.2, pl. 1), see above (*sinensis* Brass and *stegmanni* Matschie are synonyms).

N. p. ussuriensis Matschie, 1908:178, see above (*amurensis* Matschie is a synonym).

N. p. viverrinus (Temminck, 1838:285), see above (*albus* Hornaday is a synonym). Kuroda (1938) considered *N. p. albus* as a valid subspecies.

DIAGNOSIS. The following diagnostic characters apply to the genus: small and fox-like, but with legs and tail proportionately shorter than in foxes; small head with pointed muzzle; short and rounded ears; distinctive facial mask around the eyes; long body hair, generally of buff, gray, and black, although individuals exhibit a wide range of color from albinistic to melanotic and wholly yellowish (Allen, 1938); hairs of shoulder, back, and tail tipped with black; feet blackish brown (Fig. 1). Skull is small, greatest length <130 mm with short, narrow muzzle and low forehead; parietals with rugose surface and slight interparietal crest. Mandible with a distinct rounded subangular lobe on the posterior margin. Dental formula is i 3/3, c 1/1, p 4/4, m 2/3, total 42, but an extra upper molar is common. Carnassial blades are reduced and molars are relatively large (Ewer, 1973).

GENERAL CHARACTERS. The raccoon dog is about the size of a small fox; the body is relatively elongated, and the head is small with a short and sharply pointed muzzle and short, rounded ears. The furry tail is <33% of the body length (Novikov, 1956).

The face resembles that of a raccoon (*Procyon*); a black mask covers the eyes and extends beneath the muzzle. A broad white band that includes the tip of the muzzle, extends across the face from above the eyes to the ears. Thick fur occurs about the neck; the head is well-furred on the sides making it appear broad. Small ears, edged in black with white inside, barely protrude from the winter coat. The chest, throat, and feet are blackish-brown and a dark stripe connects the black of the chest and feet with the shoulder to form a cross-shaped pattern on the anterior part of the back. Fur on the tail and sides is tinged with cinnamon; the belly and inner parts of the legs are yellow-brown in color. Soles of the feet are naked. The tail has a black dorsal stripe and black tip. In cold climates, a heavy winter coat of thick and soft underfur and long guard hairs develops, giving the animal a short-legged appearance. In summer and in warm climates, the coat is thin and the animal appears more gracile. The color of the winter pelage is brownish-gray with black markings, whereas the summer pelage is strawish-orange and blackish-brown (Ognev, 1931; Stroganov, 1962).

Average mass (in kg) of six adult males and seven adult females from Japan was 4.02 (range, 2.50–5.36) and 4.87 (range, 3.41–7.50), respectively. Average mass (in kg) of three adult males and five adult females from China was 3.47 (range, 2.30–4.60) and 3.80 (range, 2.06–8.40), respectively. Standard measurements (mean and range in mm) of the Japanese animals were as follows (males and females, respectively): total length, 658.3 (570–710) and 668.6 (625–710); length of tail, 163.2 (152–180) and 156.1 (130–175); length of hindfoot, 110.0 (101–120) and 107.1 (103–115); and length of ear from notch, 47.5 (45–55) and 47.4 (40–50). Standard measurements (mean and range in mm) for the Chinese animals were (males and females, respectively): total length, 578.0 (540–629) and 500.0 (455–533); length of tail, 139.0 (130–146) and 151.7 (121–173); length of hindfoot, 100.0 (95–103) and 94.3 (83–100); and length of ear from notch, 46.8 (45–51) and 45.2 (39–51). All of the measurements of Japanese animals and some of those of Chinese animals were taken from live animals, and may not be comparable with those taken from carcasses. The average height of an adult is about 380 mm at the shoulder.

Selected cranial measurements (mean and range in mm; Allen, 1938) for nine male and eight female *N. p. procyonoides* from central China and a male and female *N. p. orestes* from Yunnan are as follows (males and females, respectively): *N. p. procyonoides*: condylobasal length, 112.2 (108–117) and 108.0 (104–110); zygomatic width, 62.7 (58–69) and 61.9 (59–66); length of nasals, 38.8 (37–41) and 37.7 (32–40), upper cheek teeth, 44.9 (41–47) and 43.8 (41–46). *N. p. orestes*: condylobasal length, 106.0 and 108.5; zygomatic width, 57.0 and 58.0; length of nasals, 36.8 and

FIG. 1. An adult *Nyctereutes procyonoides*. Photograph courtesy of the Zoological Society of San Diego.

FIG. 2. Dorsal, ventral, and lateral views of the cranium and lateral view of the mandible of *Nyctereutes procyonoides* (American Museum of Natural History 249766, female, Gifu Prefecture, Honshu, Japan). Greatest length of skull is 109.1 mm.

40.2; upper cheek teeth, 41.0 and 43.2, respectively. Cranial measurements (mean and range in mm) for 11 male and 10 female *N. p. viverrinus* from Japan were as follows (males and females, respectively): condylobasal length, 108.7 (104–113) and 108.1 (104–115); zygomatic width, 63.0 (56–67) and 62.7 (58–66); and maxillary tooth row, 43.7 (43–45) and 43.1 (41–45). The skull is illustrated in Fig. 2.

DISTRIBUTION. Raccoon dogs inhabit areas of forested streams or river valleys, and areas surrounding lakes, where thick underbrush, marshes, or reedbeds provide dense cover. The original range included the Amur and Ussuri regions of eastern Siberia; northern China southward to the states of Shansi, Szechuan, and Yunnan in the west and Fukien in the east; North Vietnam, Korea, and Japan (Fig. 3). Between 1927 and 1957 they were introduced, both intentionally and accidentally as escapees from fur farms, to

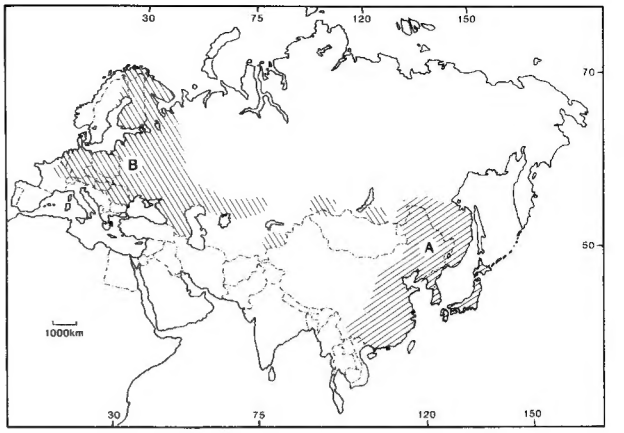

FIG. 3. Distribution of *Nyctereutes procyonoides* in Europe and Asia: original (A) and introduced (B) range (modified from Hildebrand, 1954).

several regions of European and Asian USSR where they are now feral (Novikov, 1956). As a result of their high reproductive capacity, adaptability, and general lack of enemies, raccoon dogs spread rapidly throughout northern and western Europe and are now reported in Finland, Sweden, Norway, Poland, Rumania, Czechoslovakia, Germany, France, Austria, and Hungary (Nesvadbova, 1984).

FOSSIL RECORD. Remains of *N. donnezani*, the ancestor of the raccoon dog, were found in late Pliocene sites in northern Italy, France, Hungary, and Rumania. A larger form, *N. megamastoiodes*, appeared in Spain, France, and Hungary in the early Pleistocene and was perhaps identical to a large mid-Pliocene animal, *N. sinensis*, found in China. A late Pleistocene fossil from Palestine, *N. vinetorum*, also may have been related to *N. megamastoiodes*. The European form became extinct in the Pleistocene, whereas *N. sinensis* survived and underwent a reduction in body size to that of the modern raccoon dog (Kurtén, 1968). Fossils from Pliocene–Pleistocene deposits in South Africa have been described as *N. terblanchei* (Ficcarelli et al., 1984) and may correlate with the increase in canid numbers there after about 2.5×10^6 years ago (Turner, 1986). The earliest record of fossils of the raccoon dog from Japan is that of a relatively large form, *N. viverrinus nipponicus*, from mid–upper Pleistocene deposits in Totigi Prefecture. This fossil has been described as the connecting link between *N. sinensis* of China and other fossil races, *N. v. genitor* and *N. v. okuensis*, from Neolithic sites in Japan. Fossils of the latter two races were animals slightly larger than the living *N. p. viverrinus* (Shikama, 1949).

FORM AND FUNCTION. Thermal insulation of fur is the primary factor affecting heat economy (Korhonen and Harri, 1986); hair-coat insulation properties are better in *Alopex lagopus* than in *N. procyonoides*. At 10°C the raccoon dog increases its metabolism whereas that of *A. lagopus* remains unchanged (Korhonen et al., 1983). It is suggested that this may be one factor that places a northern limit on southern species. Juvenile and adult raccoon dogs under commercial fur-farm conditions undergo a summer molt between July and October. The molt begins posteriorly and advances toward the head. It is followed by the growth of a dense winter pelage in the months of September, October, and November. Hair growth ceases in late November or December. In April, the spring molt begins and the dense underfur is shed. Growth of the thinner summer pelage begins at the head and advances toward the tail; the winter underfur is replaced by mid-June. Guard hair molts vary, but by July most winter guard hairs are lost (Korhonen et al., 1984).

Nyctereutes has a relatively distinct post-cranial skeleton characterized by heavy cervical vertebrae and stout appendicular bones in contrast to the lighter skeletons of cursorial canids, such as *Canis latrans* and *C. lupus*. Pelvis and femur proportions, which are correlated with running ability, favor slow leg movements in the short-legged raccoon dog (Hildebrand, 1952). It is probably not a swift canid. The baculum is similar to that of *Canis*, but straighter and with a narrower base, as in *Urocyon* (Hildebrand, 1954).

ONTOGENY AND REPRODUCTION. Raccoon dogs live in pairs or in small groups, but it is not clear whether they are monogamous or polygamous. Females are monestrus and come into heat during the first warm days of January, February, or March; the exact time varies with geographic location (Novikov, 1956). Estrus in females from a fur-farm population ranged from 3 to 5 days. Profiles of the concentration of sex steroids in the plasma generally are similar to those of dog (*Canis familiaris*) and Arctic fox (*A. lagopus*). Estradiol-17B levels peak (55 pg/ml) during proestrus or at beginning of estrus. After coitus the concentration falls and remains low during pregnancy. Progesterone concentrations are low during proestrus and increase rapidly to a maximum (23.4 ng/ml) during the first half of pregnancy; thereafter, the level falls and remains low, <1 ng/ml (Valtonen et al., 1978). Gestation is 59 to 64 days. The average litter size is 5 to 7, but litters with as many as 19 pups have been observed (Stroganov, 1962). Lactation lasts from 1.5 to 2 months. The neonates are born blind, and are covered with soft, black fur (Bannikov, 1964; Novikov, 1956; Stroganov, 1962). Their mass ranges from 60–110 g for *N. p. ussuriensis* to 105–115 g for *N. p. viverrinus*. The eyes open in 9–10 days and teeth erupt in 14–16 days. Mass and body measurements increase almost linearly during the first 50 to 60 days of life and by 80 to 85 days have reached values typical of subadults. Weaning occurs at 30 to 40 days, by which time the coat consists of guard hair and underfur, and the characteristic dark facial mask is developed. The color pattern of the adult, with the cross-shaped black design anteriorly on the back, usually is apparent within 50 days (Ikeda, 1983).

A male brings food to the pregnant female. Males assist in postnatal care of the offspring. The young participate in hunting and are self-supporting by 4–5 months of age, at which time they are almost adult-size, but lighter in color. The offspring often remain with the parents throughout the summer and take up independent existence in the autumn. Sexual maturity begins at about 9–11 months.

ECOLOGY. Raccoon dogs are omnivorous and opportunistic in feeding habits. Plant parts eaten include roots, stems, leaves, bulbs, fruits, nuts, berries, and seeds. The parts eaten correspond well to the growing or fruiting season of the plant species. Prey is limited to small animals (rodents, reptiles, amphibians, birds and their eggs, mollusks, and arthropods). Raccoon dogs are skilled fisherman, and in areas near rivers, lakes, and marshes, fish and amphibians compose a major part of the diet. On the seashore they eat sea urchins, crabs, dead fish, and carcasses of seabirds and other marine animals (Novikov, 1956). When commensal with man, raccoon dogs exploit refuse, grain crops, domestic fowl, game birds and their eggs, and the offal of domestic animals (Bannikov, 1964; Ikeda, 1982; Ward and Wurster-Hill, 1989).

Large differences in the diet occur in different habitats and seasons (Bannikov, 1964; Barbu, 1972; Ikeda, 1985; Viro and Makkola, 1981). In Japan, raccoon dogs on a small island showed little evidence of predation on a dense population of rodents (*Apodemus speciosus*), but fed on fish and crabs and relied heavily on plant and insect matter as the main food throughout the year (Ikeda et al., 1979). However, in Finland during the snowless period of the year, rodents (*Mus musculus*) formed the major portion of the diet, with plant matter, amphibians, invertebrates, and birds comprising a small part of the diet (Viro and Mikkola, 1981).

Predators on raccoon dogs include the wolf (*Canis lupus*), lynx (*Felis lynx*), wolverine (*Gulo gulo*), marten (*Martes flavigula, M. melampus*), golden eagle (*Aquila chrysaetos*), sea eagle (*Haliaeetus pelagicus*), eagle owl (*Bubo bubo*), and domestic dogs (*Canis familiaris*; Novikov, 1956; Stroganov, 1962). Man is the major predator of the raccoon dog. The raccoon dog is a principal fur animal of the northwestern and central regions of the USSR and it is widely hunted there (Novikov, 1956). In most parts of Europe the coat is too thick to provide satisfactory furs, and raccoon dogs are killed because they are considered a danger to small-game animals and wildfowl and are transmitters of diseases, especially anthropozoonoses (Nesvadbova, 1984). Raccoon dogs are killed by hunters, chiefly with guns or dogs. In Japan, large numbers are exterminated each year, primarily as nuisance animals, but some for fur, for bristles of calligraphy brushes, or for meat. The bones have been used as an aphrodisiac source. The average number of animals killed annually in Japan between 1951 and 1975 was 40,000 (Asahi, 1979). In China, raccoon dog skins often are seen in clothing shops and markets. The pelt, known as "Natural Tanuki, Japanese Fox, and Ussurian Raccoon" on the western market, is used for necklets, collars, and fur coats. It is not classified into grades. Large numbers of animals are bred on fur farms in Finland and the USSR (Korhonen and Harri, 1986; Novikov, 1956).

The typical habitat of raccoon dogs provides thick protective cover, is rife with small vertebrate and invertebrate prey species, and is potentially rich in nuts, fruits, and berries for part of the year. Such habitats require moisture and throughout its original and introduced range the raccoon dog occurs near lakes, rivers, streams, and marshes. In elevation, habitats have ranged from near sea level, to >3,000 m in Yunnan (Allen, 1938). In Siberia, raccoon dogs occur in broadleafed forests, shrub thickets, and in plains and marshy areas near rivers, brooks, and small lakes. They avoid conifer taiga, probably because of its characteristic lack of undergrowth and potential food sources (Novikov, 1956; Ognev, 1931; Stroganov, 1962). In Japan, they occupy mixed broadleaf–coniferous forests near lakes and rivers or the seashore (Ikeda, 1982; Ikeda et al., 1979; Ward and Wurster-Hill, 1989).

Raccoon dogs are susceptible to mange, rabies, piroplasmosis, and helminth infestations. Raccoon dogs in the Danube Delta region were infected with 25 kinds of helminths: 9 trematodes, 3 cestodes, 12 nematodes, and 1 acanthocephalan. Most commonly found were *Euparyphium melis, Echinochasmus perfoliatus, Alaria alata, Neodiplostomum spathoides* (Trematoda); *Mesocestoides lineatus* (Cestoidea); *Contracaecum* sp., *Toxocara canis, Unicinaria stenocephala, Spiruridae* gen., *Capillaria* sp. (Nematoidea); and *Macracanthorhynchus catulinus* (Acanthocephala). Of these, four (*E. melis, A. alata, M. lineatus, T. canis*) also were found in raccoon dogs from the USSR and the Far East. Infestations were heaviest in the summer when about 75% of the infected animals carried from three to eight species of helminths. In the winter, <10% of infected animals carried more than one species (Barbu, 1972). *Mycoplasma* and *Ureaplasma* were found in *N. p. viverrinus* (Kanamoto et al., 1983). Raccoon dogs from Miyazake Prefecture in Japan had *Arthrostoma miyazakiensie*, a species that occurs in the Canidae, and *Ancylostoma kusimaense*. Raccoon dogs from Kyoto carried *A. kusimaense* and *A. miyazakiensie* (Yoshida and Arizono, 1976). Ectoparasites of *N. p. viverrinus* include the ticks *Haemaphysalis flava, H. japonica japonica*, and *Ixodes ovata* (Ward and Wurster-Hill, 1989).

The natural lifespan of wild raccoon dogs is not known. Of 320 trapped raccoon dogs analyzed, the oldest age class was 5.5 years for males, 7.5 years for females (Obara, 1983). Younger animals comprised 68.4% of the total population, a finding that may have indicated heavy hunting pressure. There was a 1:1 sex ratio, also found in other populations (Ward and Wurster-Hill, 1989). Longevity of captive raccoon dogs has exceeded 14 years (M. L. Jones, in litt.).

BEHAVIOR. Most behavioral data derive from studies of captive animals (Ikeda, 1982; Kleiman, 1967; Valtonen et al., 1977; Yamamoto, 1984), although some are from anecdotal fieldnotes (Novikov, 1956; Ognev, 1931; Stroganov, 1962). Raccoon dogs hunt in pairs or family groups (Clutton-Brock et al., 1976; Ikeda, 1982; Novikov, 1956). Although occasional bearings in a telemetry study (Ward and Wurster-Hill, 1989) indicated parallel movements of two animals, there were no consistent indications of pair formation, and visual sightings at night were of solitary animals. Pairs form during the breeding season and remain together after birth of the young, but the duration of the pair bond is unknown (Bannikov, 1964; Ikeda, 1982; Novikov, 1956).

Females are courted by one or sometimes three or four males. Fights between suitors are rare. In captivity, the frequency of male–female interactions and scent-marking increases during proestrus. Copulatory behavior in raccoon dogs differs slightly from that of most canids. During sexual arousal in males, the tail forms an inverted U-shaped, a characteristic also of the bat-eared fox (*Otocyon*), and male and female do not achieve the typical back-to-back canid tie (Kleiman, 1967; Valtonen et al., 1977).

Observations of zoo animals indicate that sleeping and resting in contact with one another occurs regularly (Kleiman, 1967). They usually hibernate in pairs (Novikov, 1956). Raccoon dogs frequently engage in social grooming and share this characteristic with only one other canid, the bat-eared fox (*Otocyon*). This behavior is related to the dark facial mask of the two animals. The mask is more pronounced in the raccoon dog (Kleiman, 1967).

The raccoon dog does not bark, but emits a high-pitched whine, whimper, or mewing, usually associated with friendly or submissive behavior. Tail-wagging of submissives, typical of other canid species, does not occur in raccoon dogs. When threatened or threatening, the animal responds with a throaty growl (Ikeda, 1982).

Wild and captive raccoon dogs use "latrines" (Ikeda et al., 1979; Yamamoto, 1984); this may serve as a basis for information exchange by olfactory clues between individuals, their families, and strange conspecifics. Olfactory sense is keener than sight in raccoon dogs and is of primary importance in food acquisition. In hunting, the animal follows a wandering, stop-and-go path, its nose to the ground as it searches for food. Although the raccoon dog does not move fast, it is highly mobile and roams restlessly in search of food. Its basic foraging behavior is that of a collector or gatherer of items from the forest floor (Ikeda, 1982).

Details of activity are not well known. Radio-telemetry studies have shown the animal to be nocturnal, but often active diurnally (Ikeda, 1982; Ward and Wurster-Hill, 1989). The nocturnal activity pattern of three raccoon dogs in southern Japan, measured by sequential monitoring (Ikeda, 1982), began within 1–2 h of sunset, exhibited a bimodal pattern during the night with a period of inactivity around midnight, and stopped about 1 h after sunrise. Activity recorded during the daytime was interpreted as slight movement or grooming and occupied 4–5 h. The duration of diurnal activity and the number and duration of nocturnal activity bouts was greater than the corresponding figures for red fox (*Vulpes vulpes*), stoat (*Mustela erminea*), mink (*Mustela lutreola*), and hyaena (*Hyaena hyaena*); the increased times were necessary for raccoon dogs to find adequate quantities of their typically-small food items. In a movement study at two widely separated sites in Japan, raccoon dogs utilized about one-third of their total home range during daytime movement (Ward and Wurster-Hill, 1989).

The home ranges on a small islet in Japan changed with seasons, but overlapped each other at four seasons of the years (Ikeda et al., 1979). The average home range, 2.8 ha, was the smallest reported for raccoon dogs. The small size may have reflected the high population density, stated to be 0.46–0.86/ha. Other reports of population densities are 0.0014–0.0041/ha in the Danube Delta region (Barbu, 1972), and 0.0034 and 0.048/ha in Ussuri and Gorki, USSR, respectively (Bannikov, 1964). The average home range in southern Kyushu at the season of parturition was 26 ha (Ikeda, 1985). Home ranges at sites in southern Kyushu and northern Honshu in the autumn were 49 and 59 ha, respectively (Ward and Wurster-Hill, 1989). Home ranges may be up to 100–200 ha (Bannikov, 1964). They are not territorial (Ikeda, 1985; Ward and Wurster-Hill, 1989).

Raccoon dogs are opportunistic and use burrows constructed by other animals or dig their own (Novikov, 1956; Ognev, 1931). They have been found living among stones, in cracks in rocks, hollow tree trunks, and shrubs. In marshes, they live in heaps of hay or grass (Novikov, 1956). In areas inhabited by people, they live under roofs or in lofts of temples (Bueler, 1973). On a small islet in Japan, Ikeda et al. (1979) found 15 dens; six under tree roots, seven in hollows under concrete trenches, and two in rock crevices near the seashore. It was not clear how these dens were used in the life of the raccoon dog. In a telemetric study of nine animals at two field sites, there was no evidence that they constructed burrows for their own use (Ward and Wurster-Hill, 1989).

This is the only canid that hibernates. Hibernation generally begins in November and extends through March or early April (Novikov, 1956; Stroganov, 1962). The animals do not sleep deeply, and may emerge from the den on warm winter days to forage for food. The depth of winter sleep depends on the amount of stored fat; animals that have insufficient fat must be active all winter (Ognev, 1931). In late autumn in cold regions, mass may increase by almost 50%. The hibernation den may be insulated with dry grass or moss. In the southern part of the range (for example, the Caucasus), they do not hibernate (Novikov, 1956).

GENETICS. Two diploid numbers are found in raccoon dogs with varying numbers of associated supernumerary or B chromosomes (Ward et al., 1987). *N. p. viverrinus* has 2n = 38 + Bs, including 13 pairs of biarmed and five pairs of acrocentric autosomes, and from one to four small B chromosomes. *N. p. procyonoides* has 2n = 54 + Bs, including five pairs of biarmed and 21 pairs of acrocentric autosomes, and from one to three medium-sized B chromosomes. The sex chromosomes of each subspecies are a medium-sized X and a tiny metacentric or submetacentric Y. It is possible to recognize all the *N. p. procyonoides* chromosomes in the *N. p. viverrinus* karyotype because the karyotypes are related by eight Robertsonian changes. The karyotypes are considered to be derived from that of a common mainland ancestor. A karyotype similar to that of *N. p. viverrinus* has been postulated to be ancestral for the family (Todd, 1970; Wayne et al., 1987).

Allozyme analysis of 51 presumptive genetic loci in 17 canid species revealed *Nyctereutes* to be one of three taxa (*Otocyon* and *Urocyon* are the other two) not closely related to any of the canid species surveyed (Wayne and O'Brien, 1987). The results of an immunological study of albumins among Ursidae and other carnivore families supported closer systematic relationships with the Canidae (Seal et al., 1970), not with the Procyonidae (Frechkop, 1959).

REMARKS. The generic name *Nyctereutes* comes from the Greek *nyctos* meaning "night" and *ereuna* meaning "seeking." The specific epithet *procyonoides* derives from the Greek *prokyron* meaning "before dog" and *eidos* meaning "form." The most widely used vernacular name is the Japanese, "Tanuki." The Tanuki is the subject of many Japanese folk tales and children's stories.

The taxonomic position of *Nyctereutes* is not clear. Frechkop (1959) placed the genus with the procyonids, but Van Gelder (1978) recognized it as a distinctive canid genus. Its phylogenetic relationships within the Canidae are not well-resolved. It shows no close affinities with other canid genera. This was confirmed in an analysis of 36 canid species using numerical methods and 90 morphologic and behavioral characters (Clutton-Brock et al., 1976). On two-dimensional plots and centroid-linkage dendrograms, the raccoon dog was always an outsider, and exhibited a similarity value of <75 with *Canis*, *Vulpes*, and *Dusicyon*. Kleiman (1967) observed, in addition to some characteristics unique to raccoon dogs, several striking similarities between *Nyctereutes* and *Otocyon*. Karyotypically, raccoon dogs are unusual among canids in the possession of supernumary chromosomes (Ward et al., 1987; Wurster-Hill et al., 1986) and of other chromosomes that are homologous to those of members of the Felidae (Wayne et al., 1987).

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